

Impact of Feeding Difficulties on Parental Sense of Competence in Childcare

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Abstract: This research investigates the prevalence of infant feeding challenges and their influence on maternal parenting efficacy among mothers with children aged 0-3 years in Hangzhou, China. The findings indicate a 49.59% prevalence of feeding difficulties, along with an average maternal competence score of 71.01 ± 12.05 . A significant negative correlation is found between children's feeding issues and maternal satisfaction, highlighting the impact of feeding challenges on maternal mental health. The study also notes that parenting efficacy, family income, maternal education, and paternal involvement are positively linked with maternal satisfaction, while parental age and grandparental co-parenting have a negative effect. This study underscores the need for integrated approaches to support maternal mental health and improve parenting practices, with an emphasis on tailored interventions for different socioeconomic environments to foster optimal child development.

Keywords: Feeding difficulty; Parenting sense of competence; Maternal satisfaction; Influencing factor

1. Introduction

Feeding difficulties among infants, particularly in the early stages of life, represent a significant public health concern, as they can lead to adverse health outcomes and developmental delays[1]. Massimo et al. demonstrated that approximately 25% to 40% of children have feeding difficulties[2-4]. In China, Xu Haiqing et al. reported that the incidence of feeding difficulties in infants aged 6 ~ 36 months was 21.4%[5]. These challenges often manifest in various forms, including inadequate intake, poor weight gain, and nutritional deficiencies, which are particularly prevalent in vulnerable populations such as preterm infants and those from socioeconomically disadvantaged backgrounds. The implications of these feeding issues extend beyond immediate nutritional needs, as they can impact maternal mental health, parenting practices, and the overall family dynamic[6-8].

The study revealed that parenting sense of competence (PSOC) refers to the efficacy and ability of parents to satisfy various needs in the process of parenting. In 2001, Nagi[9] unified the definition of PSOC based on self-esteem theory and the specificity of the parenting situation. These are parenting efficacy (knowledge and skills) and parenting satisfaction (perception of value and comfort). Empirical evidence indicates that a high level of parenting competence not only affects children's social skills and emotional development but also has an impact on their mobility and personality. The advent of the Internet era has facilitated easier and faster access to knowledge and information. This has led to changes in the parenting pressure and parenting knowledge of women, which in turn affects parenting satisfaction. Parenting satisfaction is influenced by parenting knowledge, attitudes, and behaviors. Some studies have indicated that women who are more satisfied with their role as mothers are more likely to provide higher-quality care for their children.

Infant and young child feeding is a complex learning process in which the infant or young child assumes the role of identifying and guiding their feeding practices as they occur. Infant and young child feeding difficulties, parenting difficulties and family parenting disagreements have been shown to affect parenting satisfaction. It is therefore beneficial to understand the mother's sense of competence and to intervene accordingly in an effective and targeted manner, as this may have a beneficial effect on the prognosis of the disease. To date, there have been few studies conducted in China that have examined the effects of parental sense of competence and feeding practices on the occurrence of feeding difficulties in infants and young children. Consequently, this study conducted a survey and analysis of parental sense

of competence of mother of children with feeding difficulties. This was initially explored through a large-sample population-based study in Hangzhou, which investigated the factors related to parenting satisfaction in terms of feeders' feelings of feeding. It also sought to analyze the factors influencing the parental sense of competence. Understanding the contributing factors to these difficulties is crucial for developing effective interventions that support both mothers and infants.

2. Methods

This study employed the method of whole cluster sampling to select infants and children who attended the community for routine health check-ups in Hangzhou between March and July 2023. Parents of infants and children aged 0-3 years old were engaged by healthcare practitioners to explain the content and significance of the survey. Parents were then invited to participate in the survey after providing informed consent to the study. Mothers of children meeting the inclusion criteria were screened to be included in the study. The study was approved by the hospital's ethical committee (Ethics Approval: 2022-6-08).

The study was a cross-sectional study.

2.1 Data collection

It was carried out by means of a self-administered electronic questionnaire, which was distributed through Questionnaire Star and filled in by the parents themselves. The data were recovered and the questionnaires completed by mothers who met the inclusion criteria were screened and analyzed.

Ages were grouped as 0~6 months old, 6 months ~1 year old, 1~2 years old and 2~3 years old. The related factors were also categorized, such as the mother's pregnancy, delivery history, birth, feeding, and diet of the children. All children were evaluated for growth and development, and excluded from other primary diseases such as infectious diseases, contagious diseases, and endocrine and genetic diseases.

2.2 Study Instrument

The research instruments for this study comprised three questionnaires: the General Family Situation and Parenting Situation Survey. The Chinese version of the Parenting Competence Scale and the Feeding Difficulty Questionnaire were employed.

2.2.1 General Information Questionnaire

The final general information questionnaire was developed based on a comprehensive review of the literature and discussions between the researcher and senior doctors and nurses in the field of pediatrics. It comprises three sections, namely demographic information, production-related information, and newborn parenting-related information. The questionnaire included 8 items pertaining to the mother and father's age, education level, number of children, gender, birth mass, whether the child was premature, annual family income, and whether the child is mainly in his or her own care.

2.2.2 Children's Feeding Problems Screening and Questionnaire

The questionnaire comprises 6 items, including instances of Feeding difficulties such as unwillingness to eat by oneself or picky eaters, and so on. Worrying about child's feeding and eating, appetite problems, the duration of each meal, worrying about their child's growth, relationship with the child in eating process were collected from the questionnaire.

2.2.3 Chinese version of the Parenting Sense of Competence Scale (C- PSOC)

In 2014, scholars, including Yang Xiao, undertook the translation of the Parenting Sense of Competence Scale (C-PSOC) into Chinese, resulting in the Chinese version of the scale, the C-PSOC[10]. The Cronbach's alpha coefficient of the Chinese version of the C-PSOC is 0.82, with a total score ranging from 17 to 102. A higher score indicates a higher sense of parenting competence. The C-PSOC exhibits good reliability, and it is comprised of two dimensions: parenting effectiveness and parenting satisfaction. Parenting effectiveness comprises eight entries, while parenting satisfaction comprises nine entries, for a total of 17 entries. The C-PSOC is comprised of two dimensions: parenting effectiveness and parenting satisfaction. The efficacy dimension (comprising eight items: 1, 6, 7, 10, 11, 13, 15, 17) and the satisfaction dimension (nine items: 2, 3, 4, 5, 8, 9, 12, 14, 16) are divided into six levels (1, 2, 3, 4, 5, 8, 9, 12, 14, 16) for each of the efficacy dimensions, with the lowest level representing "absolutely disagree"

and the highest level representing "absolutely agree". The effectiveness dimension is scored on a six-point scale, with the endpoints labeled "absolutely disagree" and "absolutely agree." In contrast, the satisfaction dimension is scored in reverse, with the endpoints labeled "absolutely disagree" and "absolutely agree." The total score on the efficacy scale ranged from 8 to 48, with higher scores indicating a stronger sense of parenting efficacy. The satisfaction scale ranged from 9 to 54, with higher scores indicating a stronger sense of satisfaction. Finally, the total score ranged from 17 to 102, with higher scores indicating a stronger sense of parenting competence. The Cronbach's alpha coefficients of the total scale, the efficacy subscale, and the satisfaction subscale were 0.80-0.85, indicating good structural validity.

2.3 Statistical methods

The Questionnaire Star software was employed to download the data and eliminate any erroneous data and duplicate data. The RStudio software was employed to analyze the data, with missing data being multiply interpolated using the mice package.

3. Results

3.1 General information

A total of 1,042 cases of infants within three years old in the community were investigated between March 2023 and July 2023. Duplicate data and data that could not be processed due to system errors were excluded. A total of 987 valid questionnaires were collected, of which 863 were completed by mothers. The mothers were surveyed using self-designed questionnaires that collected information on general demographics, feeding difficulties, and parenting competence.

3.2 Feeding Difficulty in infants and young children

The total number of infants and young children aged 2 to 37 months with feeding difficulties was 428, with a prevalence rate of 49.59% (428/863). There was significant difference in all age groups ($P < 0.05$). There was no significant difference in the prevalence of feeding difficulties between genders ($P > 0.05$).

3.3 Scores of parenting competence

The results demonstrated that the mean PSOC scale score for mothers of infants and toddlers aged 0-3 years in Hangzhou was 71.01 ± 12.05 , with the efficacy subscale score being 35.77 ± 6.27 and the satisfaction subscale score being 35.24 ± 8.86 .

3.4 Univariate analysis of different variables on parenting competence

The general information of children was used as an independent variable, while the total score of parenting competence and the scores of each dimension were used as dependent variables in a one-way analysis. According to the results of Levene's test ($P < 0.05$). The difference is not statistically significant, indicating that the variance between the groups is uniform and can be analyzed by the analysis of covariance. The results yielded the following findings: there is a statistically significant difference in the scores of girls' sense of parenting competence compared to boys ($P < 0.05$); there is a statistically significant difference in the scores of parenting competence of children in different age groups ($P < 0.05$). The difference is statistically significant ($P < 0.01$). There is a positive correlation between paternal age and parental competence, with older fathers exhibiting higher scores. The following variables were considered: preterm birth, birth weight, number of children, family income, and the cultural background of the parents.

3.5 Multiple linear stepwise regression analysis of factors influencing parenting competence

A multiple linear stepwise regression analysis was conducted to identify the factors influencing parenting competence. The total score of parenting competence was taken as the dependent variable, and the independent variables that were statistically different ($P < 0.05$) in the univariate and correlation analyses were included in the regression model. These included age, gender, family income, parental literacy, father's age, the presence of feeding difficulties, and the primary caregiver. Multiple linear

stepwise regression analyses were conducted. The results of the multiple stepwise regression analyses indicated that the child-rearing competence score and childcare satisfaction were positively correlated with parenting efficacy, mother's parenting, grandparent's parenting, family income, and gender ($P < 0.05$). Conversely, childcare satisfaction was negatively correlated with feeding difficulties and co-parenting between mother and grandparent ($P < 0.05$).

3.6 Comparison of feeding behaviors of feeders with feeding difficulties (N=186)

A total of 186 mothers of children with feeding difficulties volunteered to complete the feeding practices questionnaire, representing 42.8% of the total number (428) of mothers approached.

Table 1 Demographic and anthropometric characteristics of participants and MANOVA with Maternal Competence and satisfaction

Influence factor	*Description of the assignment	Sample (n, %)	X^2/F value of competence	P value	X^2/F value of satisfaction	P value
Age in months (range)						
0-6months	n=1	60(6.95%)	6.658	<0.001	5.590	<0.001
-11months	n=2	268(31.05%)				
-24months	n=3	279(32.33%)				
-36months	n=4	256(29.66%)				
Gender (n, %)						
Female	n=1	402(46.58%)	3.868	0.049	4.288	0.039
Male	n=0	461(53.42%)				
Premature birth						
Yes	n=0	61(7.07%)	2.770	0.096	0.896	0.344
No	n=1	802(92.93%)				
Maternal education (n, %)						
Primary school and below	n=1	101(11.70%)	0.590	0.622	1.920	0.125
Junior high school	n=2	124(14.37%)				
College or bachelor degree	n=3	595(68.95%)				
Master degree or above	n=4	43(4.98%)				
Paternal education (n, %)						
Primary school and below	n=1	108(12.51%)	3.227	0.022	0.789	0.500
Junior high school	n=2	172(19.93%)				
College or bachelor degree	n=3	527(61.07%)				
Master degree or above	n=4	56(6.49%)				
The number of children						
First child	n=1	565(65.47%)	5.417	0.020	0.145	0.703
Second child and above	n=2	297(34.41%)				
Annual household income (Yuan)						
50000-100000	n=1	167(19.35%)	6.928	<0.001	9.539	<0.001
>100000-200000	n=2	297(34.41%)				
>200000-500000	n=3	307(35.57%)				
>500000	n=4	50(5.79%)				
Age of mother(years)						
		31.44± 4.96	1.380	0.240	3.101	0.078
Age of father(years)						
		32.89± 5.1	5.733	0.017	5.527	0.019
Feeding difficulties						
Yes	n=1	428(49.59%)	103.967	<0.001	44.033	<0.001
No	n=0	435(50.41%)				
Growth Status						
Good	n=0	783(90.73%)	10.087	0.002	1.825	0.177
bad	n=1	80(9.27%)				
Affected relationship						
Yes	n=1	33(3.82%)	4.154	0.042	0.445	0.505
No	n=0	830(96.18%)				
Father involved						
Yes	n=1	136(15.76%)	0.003	0.954	0.031	0.860
No	n=0	727(84.24%)				
Grandparent involved						
Yes	n=1	315(36.50%)	1.722	0.190	6.818	0.009
No	n=0	548(63.50%)				

*Explanation of Variable Assignment in Multiple Stepwise Regression Analysis of Factors Influencing Parental Competence in Parenting

The analysis of feeding practices factors related to the occurrence of feeding difficulties revealed that in terms of feeding practices problems, the fear of low weight for infants, the fear of hunger for infants, and the lack of communication during feeding accounted for 66.4%, 76.9%, and 64.5%, respectively, which were the most common factors affecting the occurrence of feeding difficulties. (Table 1 and Table 2)

Table 2 A multifactorial analysis of Maternal satisfaction: a stepwise regression analysis

Independent variable	Estimate	SE	t	p
Implicit variable	19.601	3.611	5.428	<0.001
Age in months	-0.0558	0.308	-1.813	0.070
Gender	1.326	0.560	2.367	0.018
Parent- effect	0.288	0.047	6.129	<0.001
Caregivers-father	5.096	2.085	2.444	0.015
Caregivers- mother	1.390	0.855	1.569	0.117
Caregivers- grandparents	4.595	2.260	2.033	0.042
Caregivers-Gran+mother	-4.305	2.354	-1.892	0.047
Maternal education	1.204	0.433	2.780	0.005
Paternal education	0.041	0.531	0.078	0.938
Annual household income (Yuan)	1.610	0.333	4.837	<0.001
Age of mother(years)	-0.118	0.056	-2.081	<0.001
Age of father(years)	-0.164	0.080	-2.045	0.041
Feeding difficulties	-1.483	0.328	-4.520	<0.001
Feeding times	-0.836	0.433	-1.933	0.053
Affected relationship	1.326	0.560	2.357	0.561

Residual standard error: 8.134 on 845 degrees of freedom
Multiple R-squared: 0.1744, Adjusted R-squared: 0.1577

4. Discussion

This study investigates the prevalence of feeding difficulties among infants aged 0 to 3 years in the Hangzhou region, alongside an assessment of maternal self-efficacy in parenting. By comparing the findings with existing literature from other cities, this research illuminates the unique challenges faced by mothers in this demographic and highlights the relationship between maternal competence and feeding difficulties. Our study found the prevalence of feeding difficulties was 49.59%, which is inferior to a survey of 15 cities in China revealed that over 58% of children exhibited feeding difficulties[11]. The discrepancy could be attributed to several factors, including regional variations in maternal education, socioeconomic status, and access to healthcare resources. Maternal competency, as indicated by the average score of 71.01 ± 12.05 , appears to be a significant contributor to this phenomenon. Research suggests that higher maternal self-efficacy correlates with improved feeding practices and child health outcomes, likely due to enhanced maternal knowledge and confidence in addressing feeding challenges. Additionally, socio-economic support systems, which are more robust in urban areas like Hangzhou, may provide mothers with more resources and education, thus fostering better parenting practices.

But the prevalence was higher than the study of Xu Haiqing [5] that reported 21.4% of infants aged 6 ~ 36 months affected by feeding difficulties. This result indicated that feeding difficulties remain a significant public health concern in Hangzhou region.

The negative correlation observed between feeding difficulties and maternal satisfaction aligns with findings from previous studies indicating that maternal mental health is significantly affected by experiences of feeding challenges. Feeding problems have a clear negative impact on both children and caretakers[12]. The psychological burden associated with feeding problems can lead to increased anxiety and depression among mothers, which, in turn, may impair their parenting capacity and responsiveness to their infants' needs. Family-focused parenting support intervention can have an impact on parents' sense of competence, family functioning, caregiving, and social support[13,14], suggesting that interventions aimed at alleviating feeding difficulties should concurrently address maternal psychological support to improve both maternal well-being and child feeding outcomes.

The study also identifies several risk factors influencing maternal satisfaction, such as parental involvement and socioeconomic status. Notably, our findings align with existing literature that links maternal education and family income to higher parenting efficacy and satisfaction levels. This correlation may be explained by the increased access to information and resources that educated parents typically have, which boosts their confidence in managing childcare challenges. Conversely, lower socioeconomic status can contribute to stress and limit access to support systems, thereby negatively impacting parenting quality[15]. Research confirms that families with higher income levels often report better parental involvement and satisfaction, suggesting that economic stability plays a crucial role in enhancing parenting outcomes. These insights advocate for policies that not only enhance educational opportunities for parents but also provide financial support to families, thereby facilitating a nurturing

environment for child development.

Lastly, the complex interplay of family involvement in childcare emerged as a key factor influencing maternal satisfaction. Our findings underline the positive impact of fathers' active participation on maternal mental health and overall family dynamics. The involvement of fathers can alleviate some of the caregiving burdens on mothers, thereby enhancing their satisfaction and reducing the likelihood of experiencing feeding difficulties. This dynamic is further supported by research indicating that increased paternal engagement leads to improved child outcomes and reduced maternal stress levels[16]. However, it is essential to note that the nature of family involvement may vary significantly across different cultural contexts, suggesting that tailored interventions that encourage active family participation in childcare are crucial for optimizing maternal and child health outcomes.

The majority of feeding difficulties in infants and young children can be attributed to irrational feeding behaviors observed in early families. In this study, we analyzed the feeding behavioral factors of caregivers related to the occurrence of infant or toddler feeding difficulties. The results showed that worrying about low infant/toddler weight, thought not enough eating of infant/toddler, and the lack of communication during feeding were the most common factors influencing the occurrence of infant/toddler feeding difficulties. To expeditiously and efficaciously address and transform optimal feeding circumstances, parents must be assisted in establishing accurate early feeding practice patterns as promptly as possible[17].

Consequently, when treating infants and young children with feeding difficulties, it is not only necessary to pay attention to the nutritional and physical development of infants and young children, but it is also necessary to understand the psychological condition of the caregivers and provide appropriate psychological support. Improving parents' mental health can enhance the quality of the parent-child relationship, thus promoting childcare satisfaction.

5. Conclusion

Feeding difficulties remain a significant public health concern in Hangzhou region. Parental sense of competence was found to act as a moderating factor between parents' feeding practices. Mothers with a high parenting sense of competence were more likely to adopt appropriate feeding practices and demonstrated higher levels of patience and flexibility in the face of feeding challenges were also observed, thus resulting in a reduction in the incidence of feeding problems in children.

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Availability of data and materials

The data supporting the findings of the study are available from the corresponding author on reasonable request.

Ethics approval

The studies involving human participants were reviewed and approved by the Hangzhou Women's Hospital Ethics Committee.

Competing interests

The authors declare that they have no financial or non-financial competing interests.

Authors' contributions

Dr. Zhan responded to this study. Dr. Zhan and Miss Huang interpreted the data and wrote the manuscript, and Mrs Qian responded by collecting and organizing data. Mrs Qian and Mrs Yao reviewed

the study data and assisted in preparing the manuscript. Dr Zhan reviewed and revised the manuscript. All authors read and approved the final manuscript.

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